

REMARKS

Introduction

Claims 1-17 remain pending in the present application. Claims 1-15 have been amended to correct minor informalities and remove reference numerals. In view of the following remarks, allowance of claims 1-15 is respectfully requested.

Claims 16 and 17 have been withdrawn. Applicant has amended non-elected claim 16 above to depend from elected claim 1. Claim 17 depends from claim 16. As set forth in MPEP § 806.05(f), upon allowance of claims 1-15 the “withdrawn process claims that depend from or otherwise require all of the limitations of the allowable product claims will be considered for rejoinder. Accordingly, Applicant respectfully submits that rejoinder of claims 16 and 17 is proper upon allowance of claim 1.

Drawings

Applicant has filed replacement drawings of Figures 1 and 2 herewith to designate each figure as prior art, in accordance with the Examiner’s constructive suggestion.

Applicant has also filed new Figs. 7 to 10 herewith illustrating the subject matter of original claims 10, 12, and 13. Applicant respectfully submits that the new drawings are supported by the original disclosure, including page 8, lines 14-17, page 9, line 17 to page 10, line 5, page 11, line 14 to page 12, line 3, and page 12, lines 9-15, and page 13, lines 11-20.

Applicant respectfully submits that the features of original claim 9 are supported by Figure 5, which show aligned removed material 15 in both upper and lower fan.

Figures 8a and 8b clearly illustrate an embodiment in which “the radial plate portions of each of the two superimposed fans includes holes or thinned portions in different zones,” as recited in claim 10.

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Figure 9 illustrates rotor balancing holes in line with a blade of a pre-balanced fan, as recited in claim 12.

Claim 13 recites that “the fan has a central bore de-centered so as to bring the axis of rotation of the machine into coincidence with the center of gravity of the fan.” This feature is shown in new Fig. 10, in which bore 40 is off center.

Approval and entry of the new drawings and withdrawal of the objections to the drawings are respectfully requested.

Specification

Applicant has amended the specification above to modify the headings and sub-headings, introduce a cross-reference to a related application, and delete part of the abstract. Applicant respectfully submits that these amendments address all of the objections raised by the Examiner. Accordingly, Applicant respectfully requests entry of the above amendments and withdrawal of the objections to the specification.

The specification has also been amended to include reference to new Figures 7 to 10 in the “Brief Description of Several Views of the Drawings” section and in the “Detailed Description of Embodiments of the Invention” section. Applicant respectfully submits that these amendments are fully supported by the original disclosure, inasmuch as Applicant has merely added Figures to show what is already described in the specification’s written description. Accordingly, entry of these amendments is respectfully requested.

Rejection under 35 U.S.C. § 103

Claims 1-4 and 7-15 have been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over the alleged Applicant’s Admitted Prior Art (AAPA) in view of U.S. Patent

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No. 5,763,968 to Hayashi et al. The Examiner asserts that the alleged AAPA discloses the claimed invention, except for teaching a fan fixed to a rotor is pre-balanced. The Examiner asserts that this missing feature is taught at column 4, lines 12-14 of Hayashi. Applicant respectfully disagrees, and traverses the rejection for at least the following reasons.

To better understand the differences between the present invention and the applied art, Applicant will briefly describe the state of the art and its problems, as described in the specification. A rotary electrical machine includes a fan mounted, such as by welding (see page 3, lines 2-3) on a rotor. Conventionally, fans are asymmetrical when fabricated, and cannot be “naturally balanced.” (Page 3, lines 4-5) The fitting of an unbalanced fan onto an unbalanced rotor establishes a large degree of imbalance in the machine, creating problems such as significant shaft bending and rotor radial vibrations. (Page 3, lines 6-11)

To overcome these problems, it has been known to carry out balancing operations on the machine after it has been assembled. Various types of balancing operations are described in the specification at page 3, lines 12-21. These balancing operations create other problems. First, conventional balancing operations “make it necessary to provide a relatively wide passage across the blades of the fan.” (Page 3, lines 21-22) As a consequence, limitations are placed on the number and shapes of fan blades that may be employed. (Page 4, lines 9-16)

The present invention in its claimed embodiment overcomes these problems through the use of a fan which has been pre-balanced, i.e., balanced prior to mounting on the rotor. (Page 5, lines 10-18) In this manner, the inherent imbalance of the fan is nil, or very small if there are any errors in centering with respect to the axis of rotation of the machine during its fastening to the rotor. (Page 5, lines 18-20) Because the imbalance is greatly reduced if not eliminated through the use of a pre-balanced fan, any of the above-mentioned centering errors are eliminated or can be easily corrected with reduced modification to the rotor. Balancing operations likewise are reduced. (Page 5, line 20 to page 6, line 7)

As pointed out by the Examiner, column 4, lines 12-14 of Hayashi disclose a fan 6 having a support member 63 with a balance-adjusting hole 65. However, balance-adjusting member 65 is not responsible for pre-balancing of the fan 6. To the contrary, Hayashi is clear in its express description that the balance-adjusting member 65 does not serve to pre-balance the fan. As described at column 4, lines 31-34 and illustrated in Fig. 5, hatched portions X (see Fig. 5) of the fan 6 are cut about the outer periphery of the balancing-adjusting member 65 *after* the fan has been mounted in order to adjust the rotational balance of the fan 6. The balance-adjusting member 65 allows for post-mount balancing of fan 6, and in no way contribute to the pre-balancing of the fan. The operator, after mounting the unbalance fan 6 on the rotor, then selectively cuts around balance-adjusting member 65 in order to locate the center of gravity of the front cooling fan 6 on the axis of the shaft 4. Further support for Applicant's interpretation of Hayashi is found at column 2, lines 5-6, which characterizes Fig. 4 as illustrating "the cooling fan fixed to the rotor to have rotation balance adjusted. *See also* column 2, lines 7-9.

For these reasons, Applicant respectfully submits that Hayashi et al., when taken alone or in combination with the alleged AAPA, does not teach or reasonably suggest the invention claimed in claim 1. Applicant further respectfully submits that claims 2-4 and 7-15, which depend from claim 1 and incorporate the distinguishing features thereof, are patentable over the applied art for the above reasons and the additional reason that the added features of many of the dependent claims are not suggested. For example, claim 2 recites that the radial plate portion of the fan has a non-constant thickness. Applicant respectfully submits that Hayashi does not disclose this feature. In the Office Action, the Examiner points to "the web area near reference sign 21 in Fig. 2." (See Office Action, page 5, lines 12-14.) Applicant respectfully submits that reference sign 21 is not near the fan. Applicant further respectfully submits that Hayashi does not disclose the thickened and/or thin zones of claim 3. The Examiner has not pointed to any passage of Hayashi to support his opinion that the rotor is pre-balanced, as recited in claim 11. With respect to claim 12, Applicant respectfully submits that there must

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have been some motivation in the art, not mere hindsight, for aligning the balancing hole of the rotor with the blade of a pre-balanced fan. An example of a de-centered fan bore, as recited in claim 13, is shown in Fig. 5 in which notch 41 de-centers the bore of the fan in such a way that the axis of rotation of the electrical machine coincides with the center of gravity of the fan. (Page 12, line 16 to page 13, line 2) Figure 2 of the alleged AAPA does not illustrate a notch or any other manipulation to the central bore.

For these reasons, Applicant respectfully requests reconsideration and withdrawal of the Section 103(a) rejection of claim 1-4 and 7-15.

Claim 5 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over the alleged AAPA in view of Hayashi and further in view of U.S. Patent No. 5,947,686 to Keyes. The Examiner relies on Keyes to overcome the failure of the alleged AAPA and Hayashi to disclose a blade with additions of material for the purpose of balancing the fan.

Applicant respectfully traverses this rejection. Claim 5 depends from claim 1 and incorporates its distinguishing features. As explained above in reference to claim 1, the alleged AAPA and Hayashi, when taken alone or in combination, fail to teach a rotary electrical machine having a pre-balanced fan. Keyes likewise fails to disclose this feature, instead described the post-mount balancing of the fan: "The fan is balanced after all the covers 20 have been placed on all the fan blades, and further after the deodorant means 40 is also installed and loaded with deodorant. Balancing is accomplished by adding or deleting weights on each fan blade as needed."

For these reasons, Applicant respectfully requests reconsideration and withdrawal of the Section 103(a) rejection of claim 5.

Claim 6 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over the alleged AAPA in view of Hayashi and further in view of U.S. Patent No. 5,193,983 to Shyu.

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The Examiner relies on Shyu to overcome the failure of the alleged AAPA and Hayashi to disclose a chamfer for balancing the fan.

Applicant respectfully traverses this rejection. Claim 6 depends from claim 1 and incorporates its distinguishing features. As explained above in reference to claim 1, the alleged AAPA and Hayashi, when taken alone or in combination, fail to teach a rotary electrical machine having a pre-balanced fan. Shyu likewise fails to disclose this feature, instead describing post-mount balancing of a fan which has not been pre-balanced.

For these reasons, Applicant respectfully requests reconsideration and withdrawal of the Section 103(a) rejection of claim 6.


Conclusion

It is respectfully submitted that a full and complete response has been made to the outstanding Office Action and, as such, there being no other objections or rejections, this application is in condition for allowance, and a notice to this effect is earnestly solicited.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided below.

If any further fees are required in connection with the filing of this amendment, please charge the same to our Deposit Account debit Account 50-0548.

Respectfully submitted,


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